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Technical Note 81

Crawfish

Crawfish Fact Sheet 3

Identification, Stocking, and Trapping

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For more information about crawfish pond considerations, contact your local Natural Resources Conservation Service.

Crawfish Pond Considerations

Pond Construction

Crawfish ponds should be located in flat, open areas, and the soils should have sufficient amounts of clay to support the burrowing and hold water. Perimeter levees should have a core trench cleared of debris to prevent seepage. The minimum perimeter levee base should be in accordance with NRCS standards and specifications on Dikes (356) to prevent leakage from burrowing activities. Typically, a levee system should be designed to contain 8-12 inches in rotational ponds and 18-22 inches in permanent ponds to cultivate crawfish. The land should have no more than a six-inch fall between perimeter levees. Otherwise, the area should be leveled or divided into two or more ponds. Ponds with steep elevation differences restrict water management and reduce harvest efficiency. Interior channels reduce water circulation. As a result areas away from the channel may be low in dissolved oxygen. This reduces the effective production area and makes complete drainage difficult. Any areas difficult to drain may serve as refuge for predatory fish. Interior or baffle levees are constructed to guide water through the pond for proper aeration and to assist in maintaining water quality. Baffle levees should be approximately six feet wide at the base. The baffle levees should also extend a minimum of six inches above the water level after they have settled. Baffle levees should be spaced 150 to 300 feet apart to facilitate water circulation. Core trenches in baffle levees are not necessary. The land-water interface afforded by levees is important for the burrows used by crawfish broodstock. A re-circulation canal outside the perimeter levee, and a re-lift pump or paddlewheel aerator will aid in water circulation and minimize water discharge.

Ponds designed to re-circulate water are important in areas where the quality of the surface water supply fluctuates or where well water must be pumped from great depths. Drains should be matched with the pond size, pumping capacity and projected rainfall. The pond's design must allow vehicle access to the pond in wet and dry conditions and allow efficient use of harvesting equipment. Refer to NRCS standards and specifications on Dikes (356), Water Control Structures (587) and Access Road (560).

With a large portion of the state of Louisiana covered by freshwater, it's no surprise the capability to produce crawfish is high. Although there are various types of crawfish production ponds, many share similar management considerations. This jobsheet reviews considerations associated with typical production ponds.

Water Supply

Surface and subsurface water are acceptable for crawfish farming. Wells provide predator free water, but have limited discharge capacity, higher pumping costs and must be oxygenated. Well water often contains soluble iron and hydrogen sulfide that must be removed before the water enters the pond. Surface water is desirable if it is pollution free and fish can be screened out.

Water Quantity

A pumping capacity of 70 to 100 gallons per minute per surface acre is recommended for intensive management. This rate is needed to exchange all the water in the pond over a four to five day period. Re-circulating and/or flushing the pond with fresh, oxygenated water maintains satisfactory water quality.

Water Quality

Dissolved oxygen is an important water quality parameter in crawfish production. Temperature has a major effect on oxygen level in ponds. Warm water cannot hold as much oxygen as cold water. Higher temperatures also increase biological activity, which consumes oxygen. Low dissolved oxygen is a critical problem in crawfish production, especially during the first two to six weeks after initial flood-up. Dissolved oxygen should be maintained above three parts per million (ppm). Dissolved oxygen should be measured regularly, especially during warm, cloudy weather. Dissolved oxygen is lowest in the morning so this is when it should be checked.

The water pH should range from 6.5-7.5 at dawn, and both total hardness and alkalinity should range between 50-250 ppm as calcium carbonate. Agricultural limestone can be incorporated into the pond bottom to increase these parameters if needed.

Un-ionized ammonia and nitrate are toxic to crawfish at concentrations exceeding 2 and 4 ppm, respectively. Concentrations this high are not likely to occur in crawfish ponds because production intensity is low and ammonia is rapidly taken up by aquatic plants. Iron and hydrogen sulfide are toxic to crawfish at concentrations often found in subsurface well water; however, the two compounds are lowered to non-harmful concentrations when well water is oxygenated. Where iron and hydrogen sulfide concentrations are high, it may be necessary to place a flume ditch between the well and crawfish pond to allow the iron to precipitate out.

Crawfish producers in coastal regions should also monitor tidal influenced surface water during drought periods. Adult crawfish can tolerate salinity as high as 35 parts per thousand (ppt) for a very short term, but spawning is affected at 12-15 ppt. Newly hatched young die at 15 ppt. Salinity also affects the type of vegetation grown for forage.

Crawfish are very sensitive to most chemical pesticides and as a result of careless application, production can be eliminated in a short period. Always be safe and read the label of any chemical or compound before using it in or near crawfish ponds.

Re-Circulation

Aerated water must be transported through the pond to reach the crawfish to achieve maximum survival, growth and yield. Water should be guided through the pond by a series of small, internal baffle levees, which direct the flow of water throughout all areas of the pond. Mechanical paddle-wheeled type aerators, ¼ to 1/3 horsepower per surface acre can be used to aerate and circulate the crawfish pond water with more cost effectiveness than water replacement by pumping.

Post Season Care

In summer, minor levee work around a crawfish pond can be performed. Ten to twelve inches of loose soil can be added on top of the burrows without causing serious crawfish mortalities, but the less soil added, the better. When levee work is necessary, use soil from outside the pond, if possible. The fewer disturbances to the interior portion of the levee where crawfish burrow, the better the crawfish survival rate. Preparing a seedbed in a crawfish pond to plant forage can be done with little or no effect on crawfish that have already burrowed. Land leveling or major levee repair will increase crawfish mortality. Severe compacting of soil by heavy equipment may not allow crawfish to escape burrows and will result in death. In these cases, 10-15 pounds of mature broodstock should be added to the pond after leveling or major repair.

Timing of Flood-Up

Ponds should not be flooded until the daytime high air temperatures average in the low 80°F range and nighttime lows average 65°-70°F. Flooding green rice or sorghum sudangrass before October 1 may be possible if close attention to oxygen levels is observed and corrective actions (recirculation) is taken when necessary. An early flood in harvested rice fields or naturally vegetated ponds with terrestrial grasses is very risky because the amount of organic matter present. It is better to flood a little later with the possibility of late crawfish than flooding early and losing the young crawfish because of low oxygen conditions.

It is not necessary to put the full amount of water in a pond (8-12 inches in rice/crawfish rotational ponds or 18-22 inches in permanent ponds) during the initial flood-up unless birds or other predators are a problem. Four to six inches of water is usually sufficient. Less water in the pond reduces pumping and there is less water to aerate and replace. Also, less vegetation is exposed to the water column, reducing the amount of decomposition. About 7-10 days after the initial flood, if indicated by low oxygen determinations, it may be necessary to flush or replace the pond water. To flush a pond, drain it down to three inches before pumping unless predators are a problem. The fresh aerated water will flow through the pond, pushing the bad water out the overflow. Results are better if the ponds are constructed with interior baffle levees. Ponds should be flooded every 7-10 days or as indicated necessary by low oxygen levels until temperatures fall below 65oF and oxygen levels stabilize. When oxygen levels increase with cooler air, the water level should be gradually brought up to full depth generally by early to mid December.

De-Watering (Draining) Ponds

No specific date is considered the perfect time to drain a crawfish pond. There are a number of factors to consider before draining. The existing crawfish population should be evaluated before making a final decision to drain. Two important issues when draining a pond include: 1) making sure 20% of the females are in the tan or brown eggs stage or burrowing is beginning, and 2) to drain off the water slowly 1 to 1½ inches per day except where crawfish are stunted. Draining a crawfish pond early (March) to plant a rice crop often forces immature crawfish to burrow into the levees. This could delay next year's harvest. Waiting until May or June to drain a pond will allow a higher percentage of crawfish to reach maturity and ensure that a larger number of crawfish will burrow. If the decision is made to cease harvesting, and the pond population is dominated by immature young, a different draining scheme should be used. In this situation, drop the water level quickly to 8-10 inches, then hold this depth until the water temperature increases. Dropping the water and allowing the water temperature to rise will induce the crawfish to mature quickly and begin burrowing activity.

References

i. 1996. Louisiana State University Agricultural Center, Louisiana Cooperative Extension Service. Crawfish Production Manual. Publication 2637.

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iii. 1990. Louisiana State University Agricultural Center, Louisiana Cooperative Extension Service. Southern Regional Aquaculture Center. Crawfish Production Systems. Publication 2426

iv. 1976 Louisiana Wild life and Fisheries Commission. Crawfish Farming.